

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
CHECK VALVE ASSEMBLY, ITEM 128 ----- SV767699-1 (1)	2/2	128FM01 Fails to close, internal leakage. Surface imperfections on flapper or seat, contamination.	END ITEM: Reverse flow path through valve in check direction. GFE INTERFACE: Unable to purge a large gas bubble in the coolant pump, resulting in inability to prime pump. Loss of coolant flow during preEVA EMU Checkout. MISSION: Loss of use of one EMU. CREW/VEHICLE: None. Crew discomfort. (hot) TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - The valve has a soft elastameric (silicone) flapper and is pressure loaded closed in the check direction. Nominal reverse pressure is 1.0 psi. Filtration is provided to 20 microns by the Item 141 Gas Trap Screen. B. Test - Component Acceptance Test - An internal leakage test is performed per AT-E-127/128 in which the check valve outlet is pressurized to 0.9 - 1.1 psid with water. Leakage must not exceed 1.0 scc/min. PDA Test - A leakage test is run per SEMU-60-010 where the check valve is pressurized to 0.9 - 1.1 psid. Leakage must not exceed 3.8 scc/min. H2O. Proper function of the check valve is also verified during the coolant loop dry charge test. Starting with an empty cooling circuit, the PLSS water pump must be capable of filling the cooling circuit and remove all gas bubbles within 10 minutes of starting the pump. A failed open check valve would prevent the pump from operating properly. Certification Test - Certified for a useful life of 25 years (ref. EMUM1-0023). C. Inspection - Cause - Surface imperfections on flapper or seat. The check valve housing and flapper sealing interfaces are 100% inspected to meet dimensional and surface finish requirements. Cause - Contamination. A cleanliness level of HS3150 EM150 is maintained during assembly and testing of the check valve. This cleanliness level requires a mandatory inspection for verification. D. Failure History - EMU-128-D002 (8-27-80) Internal leakage due to tool marks in Kel-F housing. Corrective action was to change sealing surface finish requirement. H-EMU-128-D003 (12-12-83) Excessive internal leakage in reverse flow direction due to surface irregularities on housing face. Corrective action was to revise component acceptance test to detect small leakage. J-EMU-128-A001 (06/02/95) Item 128 Check Valve S/N 004 failed reverse leakage test. Spec is 56.5 cc; actual 240 cc per 15 minutes. Addition of LCVG bypass (T6 to T4) created a flow path across check valve (in reverse direction) invalidating the 128 reverse flow test. Revised the test procedure. E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, Dry LCVG Degas Test. None for EET processing. F. Operational Use - Crew Response - PreEVA: Trouble shoot problem. If no success, consider third EMU if available, otherwise continue with EVA prep.

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		128FM01		Training - Standard training covers this failure mode. Operational Considerations - RTDS allows ground monitoring of EMU systems. EVA check list procedures verify hardware integrity and systems operational status prior to EVA. Flight rules define loss of EVA for loss of thermal control.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-128 CHECK VALVE AND HOUSING
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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